CHAPTER 1

INTRODUCTION

1-1. Purpose. This manual provides guidance for incorporating environmental considerations in the planning, engineering, design, and construction of flood control channels, levees, and associated structures.

1-2. Scope. This manual pertains to projects that involve modifications of natural stream channels to reduce damages due to flooding, bed scour, or bank erosion. Although some of the information below may be applied to modification of large rivers, the emphasis of this manual is on channels not open to commercial navigation. Channel modifications for flood and erosion control include clearing and snagging; channel straightening; channel enlargement; streambank protection; channel lining; and construction of grade control structures, culverts, levees, and floodwalls. This manual covers some of the principal environmental factors that should be considered in projects that involve stream channel modification, as well as opportunities for incorporating environmental features into these projects. This manual is intended to be compatible with EM 1110-2-1601 and EM 1110-2-1913.

1-3. Applicability. This manual applies to all field operating activities having Civil Works responsibilities.

1-4. References.

a. 33 CFR 208. 10, Local Flood Protection Works; Maintenance and Operation of Structures and Facilities.

b. 40 CFR 1500-1508, Regulations for Implementing the Procedural Provisions of the National Environmental Policy Act.

c. ER 200-2-2.

d. ER 1105-2-100.

e. ER 1110-2-400.

f. ER 1130-2-303.

g. ER 1130-2-335.

h. ER 1130-2-339.

i. ER 1130-2-400.

j. ER 1130-2-405.

k. ER 1165-2-26.

l. ER 1165-2-27.

m. ER 1165-2-28.

n. ER 1165-2-400.

o. EM 1110-1-400.

p. EM 1110-2-38.

q. EM 1110-2-301.

r. EM 1110-2-410.

s. EM 1110-2-1201.

t. EM 1110-2-1601.

u. EM 1110-2-1913.

v. EP 1110-1-3.

w. EP 1165-2-1.

x. EP 1165-2-501.

y. Clar, Michael, et al. 1983. "Restoration Techniques for Problem Soils at Corps of Engineers Construction Sites," Instruction Report EL-83-1.*

z. Henderson, J. E., and Shields, F. D., Jr. 1984. "Environmental Features for Streambank Protection Projects," Technical Report E-84 -11. *

aa. Hynson, J. R., et al. 1985. "Environmental Features for Streams ide Levee Projects," Technical Report E-85-7 . *

bb. Lee, C. R., et al. 1985. "Restoration of Problem Soil Materials at Corps of Engineers Construction Sites," Instruction Report EL-85-2 . *

cc. Nunnally, R. N., and Shields, F. D., Jr. 1985. "Incorporation of Environmental Features in Flood Control Channel Projects," Technical Report E-85-3.*

dd. Shields, F. D., Jr. 1982. "Environmental Features for Flood-Control Projects," Technical Report E-82-7. *

ee. Smardon, R. C., et al. 1988. "Visual Assessment Procedures for US Army Corps of Engineers," Instruction Report EL-88-l. *

---

* Available from: Technical Information Center, US Army Engineer Waterways Experiment Station, PO Box 631, Vicksburg, MS 39180-0631.

1-5. Bibliography. Bibliographic references are indicated as needed in the text and are listed in Appendix A. These documents are available for loan from the US Army Engineer Waterways Experiment Station (WES) Technical Information Center Library, PO Box 631, Vicksburg, Mississippi 39180-0631. In addition, copies of the reports are available through the National Technical Information Service (NTIS), 5285 Port Royal Road, Springfield, VA 22161.

1-6. Background.

a. Use of this manual requires knowledge of Corps authority in flood damage reduction and environmental policy. Engineer Pamphlet 1165-2-1 provides a digest of Corps authorities. Engineer Regulation 1165-2-26 requires that the Corps provide leadership and take action to restore and preserve the natural and beneficial values of the 100-year floodplain and to avoid development in the 100-year floodplain unless it is the only practicable alternative. Policy documents addressing environmental issues include ER 1105-2-100, chapter 7, which points out that it is national policy that fish and wildlife resources conservation be given equal consideration with other study purposes in the formulation and evaluation of alternative plans. Also, historic properties that are included or are eligible for inclusion in the National Register of Historic Places must be considered in formulating recommendations for project authorization and implementation. Coordination with the State Historic Preservation Officer and the Advisory Council on Historic Preservation is required. Engineer Regulation 2 00-2-2 provides guidance for preparation of environmental impact statements.

b. Engineer Regulation 1165-2-28 states that environmental enhancement is an objective of Federal water resource programs to be considered in planning, design, construction, operation, and maintenance of projects and that opportunities for enhancement of the environment should be sought through each phase of project development. Engineer Pamphlet 1165-2-501 outlines the Corps policy and objectives for full consideration of the environment in planning, development, and management of water and related land resources, consistent with environmental statutes and executive guidelines.

c. Engineer Regulation 1165-2-27 provides guidance for the planning and establishment of wetlands using dredged material from water resources development projects. Relevant guidance in the area of recreation includes ER 1165-2-400, EM 1110-2-410, ER 1130-2-400, ER 1110-2-400, and EM 1110-1-400, Change 1. Engineer Regulation 1130-2-405 provides guidance for overload vehicle trails.

1-7. Checklist of Data Sources . Potential sources of data for planning and design of environmental features for flood control channel projects are listed in Appendix B. These data may be available at the District office, and the various functional elements (e.g., hydrology, hydraulics, environmental resources and geotechnical) should be consulted. Coordination among these elements can also facilitate interpretation of the data in the context of the project.

1-8. Design Procedure. Appendix C is provided to illustrate how the information in this manual can be integrated into a project.

1-9. Glossary. A glossary of terms used in this manual is provided following the appendixes.